

Before the
Federal Communications Commission
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of:

Allocation of Spectrum Below
5 GHz Transferred From Federal
Government Use

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ET Docket No. 94-32

To: The Commission

COMMENTS OF IN-FLIGHT PHONE CORPORATION

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TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	i
BACKGROUND	1
ARGUMENT	3
I. It Would Be Unlawful for the Commission to Allocate the 2390-2400 MHz Band to a Service Category Encompassing Any Fixed or Mobile Communication	3
A. Allocating the Band to a Service that Permits Any Fixed or Mobile Communication Would Be Inconsistent With Section 303 of the Communications Act	3
B. Allocating the Band to the New Fixed and Mobile Service Category Also Would Be Inconsistent With Section 115(a) of the National Telecommunications and Information Administration Organization Act	7
C. It Also Would Be Arbitrary and Capricious for the Commission to Allocate the 2390-2400 MHz Band to This Broad Service Category Given the Agency's Own Findings	8
II. Allocating Spectrum to a Service that Allows Any Fixed or Mobile Communication Would be Inconsistent with the Commission's Stated Objective in Proposing an Allocation to This Service Category	10
III. The Commission Should Allocate the 2390-2400 MHz Band to Airline Audio and Video Service Instead of Any of the Other Discrete Services the Agency Mentions Favorably	13
A. AAVS Will Serve the Public Interest for Five Reasons	13
1. AAVS, Unlike Any Other Service that Has Been Proposed for this Band, Can Co-Exist With Co-Channel Amateur Operations	13
2. AAVS Would Satisfy an Unmet Demand for Diverse, Live Programming by the 1.36 Million People Who Fly on Commercial Aircraft Each Day	15

3.	The Public Could Benefit Quickly from an AAVS Allocation Because In-Flight Can Provide AAVS Almost Immediately Upon Issuance of a License to Provide the Service	17
4.	A Regulatory Structure to Govern AAVS Can Be Implemented Easily	18
5.	AAVS Would Provide an Important New Source of Revenue for the Financially Strapped U.S. Commercial Airline Industry	19
B.	Section 7 of the Communications Act Requires an Allocation to AAVS Rather than Any of the Other Discrete Services Mentioned Favorably by the Commission	20
CONCLUSION		22

SUMMARY

In its Notice of Proposed Rulemaking, the Commission has proposed to allocate three former government bands in one of two ways. Under the first option, it would allocate all three bands to a new Fixed and Mobile Service, thereby allowing licensees to use all of this spectrum for any purpose subject to rules designed to prevent harmful interference to other Fixed and Mobile Service licenses. Alternatively, the agency would allocate each of the three bands to one or more discrete services, and it asks for comments on several services it believes are in the public interest. One of the bands that will be allocated in this proceeding is 2390-2400 MHz. And one of the discrete services mentioned favorably as a possible user of this particular band is an airline audio and video service ("AAVS"). In-Flight has urged the FCC to allocate 2390-2400 MHz to AAVS in comments responding to the Commission's earlier Notice of Inquiry in this proceeding.

In-Flight's comments demonstrate that allocation of all three bands to the new Fixed and Mobile Service would be unlawful under several statutes. First, it would be unlawful under Section 303 of the Communications Act because this provision requires the Commission to allocate spectrum to discrete services yet Fixed and Mobile Service is not a discrete service. Second, it would be unlawful under Section 115 of the National Telecommunications and Information Administration Organization Act. That provision requires the Commission to allocate this band to a service that is substantially compatible with co-channel amateur operations to which the band has long been allocated. While AAVS is compatible

with co-channel amateur operations, the vast majority of fixed or mobile services cannot co-exist with co-channel amateur operations. Third, it would violate Section 706 of the Administrative Procedure Act because that provision prohibits agencies from making allocation decisions based on findings that are arbitrary and capricious. Allocating these bands to the new Fixed and Mobile Service would be arbitrary and capricious because it would be flatly inconsistent with the agency's own findings in several respects described in the Comments.

In-Flights's Comments also show that allocating 2390-2400 MHz to the new Fixed and Mobile Service would be inconsistent with the Commission's own stated objective in proposing that allocation. While the Commission stated that it might want to allocate the 2390-2400 MHz (as well as the other two bands at issue in this proceeding) to Fixed and Mobile Service because it wanted to let the marketplace decide what services are offered on this band, the agency cannot achieve this objective by allocating spectrum to this service. The reason is that it must adopt technical standards governing licensee operation in whatever new service it authorizes, and the agency's selection of those important technical standards will force it effectively to decide what types of fixed and mobile services to permit.

Rather than allocate the 2390-2400 MHz band to a service encompassing any fixed or mobile communications, the Commission instead should allocate this band to AAVS for five reasons described in detail in In-Flight's Comments. First, AAVS, unlike any other service that has been proposed for this band, can co-exist with co-channel amateur operations. Second, AAVS would

satisfy an unmet demand for diverse, live programming by the nearly 1.4 million people who fly on commercial aircraft each day. Third, In-Flight can provide AAVS almost immediately upon issuance of a license to provide this service since the company already has developed much of the technology necessary to provide the service pursuant to an earlier experimental license. Moreover, it is undertaking all remaining development work pursuant to a second experimental license authorizing it to provide AAVS to 100 aircraft on the 2390-2400 MHz band. Fourth, a regulatory structure to govern AAVS can be implemented easily. In-Flight proposes core elements of this regulatory structure in its comments. One important feature of that regulatory structure would be to grant AAVS licenses, with each licensee providing AAVS on five megahertz of spectrum. Fifth, AAVS would provide an important source of revenue for the financially strapped U.S. commercial airline industry.

The Commission also should allocate 2390-2400 MHz to AAVS rather than any of the other discrete services mentioned favorably by the Commission because Section 7 of the Communications Act requires it. Section 7 requires the Commission, in allocating spectrum, to prefer a new service over other services. AAVS is plainly a new service, but none of the other services discussed favorably by the Commission -- unlicensed PCS, MDS, and wireless local loop service -- is new.

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In-Flight shows in Section I of these comments that allocating the 2390-2400 MHz band to a new "Fixed and Mobile Service" would be unlawful. Moreover, it shows in Section II that the agency would not achieve its stated objective even if it were to allocate the band to this new service. The company explains in Section III why the Commission should allocate this band to a new ground-to-air audio and video programming service ("AAVS")^{1/}

BACKGROUND

The Commission's Notice of Proposed Rulemaking results directly from a 1993 law amending the National Telecommunications and Information Administration Organization Act in order to make additional spectrum available for commercial use.^{2/} That amendment gave the Federal government until August 10 of this year to abandon 50 megahertz of spectrum then allocated for Federal government use, and it required the Secretary of Commerce to decide what bands the

^{1/} In-Flight is one of three licensees providing 800 MHz air-ground telephone service under the regulatory structure set forth in Section 22.1100 et seq. of the Commission's Rules.

^{2/} See Omnibus Budget Reconciliation Act of 1993 § 6001, adding Sections 111-117 to the Nat. Telecommun. and Info. Admin. Organ. Act, codified at 47 U.S.C.A. § 923-27 (1994 supp.).

Federal government would abandon. In response to that law, the Secretary ordered Federal government users to abandon the 2390-2400 MHz band as well as the 2402-2417 MHz and 4660-4685 MHz bands effective August 10, 1994.

In its Notice, the Commission has proposed to allocate the three former government bands in one of two ways. Under option number one, the agency would allocate all 50 MHz to a new "Fixed and Mobile Service" under which licensees could provide any communications service that complied with new FCC rules designed to prevent harmful interference to other Fixed and Mobile Service licenses.^{3/} Alternatively, the agency would allocate each of the three bands to one or more discrete services, and it asks for comments on several which it believes are in the public interest.^{4/} AAVS is one of the services about which the Commission expresses interest. In-Flight urged the FCC to allocate the 2390-2400 MHz band to AAVS in comments responding to the Commission's earlier Notice of Inquiry in this proceeding.^{5/}

^{3/} Notice at ¶ ¶ 8-9.

^{4/} Notice at ¶ ¶ 11-15.

^{5/} See Reply Comments of In-Flight Phone Corp. (Aug. 30, 1994). AAVS is a one-way service allowing airline passengers to receive multiple channels of live, broadcast-quality audio and video programming at any time during their flights. An AAVS licensee would provide service from fixed-site base stations at roughly 70 locations in the United States. These stations would transmit simultaneously all programming offered by the AAVS licensee and would operate in a cellular configuration so that all aircraft could receive all programming continuously, including the times at which they fly out of the coverage range of one base station and into the coverage range of another. The 2390-2400 MHz band provides sufficient capacity for two AAVS licensees. Each licensee would operate on 5 MHz and would divide its bandwidth assignment into six channel blocks of equal size, with each base station using a single channel block. Five megahertz of spectrum is sufficient
(continued...)

In-Flight's present comments are confined to the Commission's proposals as they affect the 2390-2400 MHz band because AAVS cannot be provided on either of the other two bands that are the subject of the Notice. An AAVS licensee could not use the 2402-2417 MHz band because AAVS transmitters could interfere with reception of transmissions from co-channel Part 15 devices operating near AAVS transmitters, and co-channel Part 15 transmitters could interfere with reception of AAVS signals at the edge of each AAVS transmitter's coverage area. An AAVS licensee could not economically use the 4660-4685 MHz band since power amplifiers would be significantly more expensive given the near quadrupling of transmitter power that would be necessary to operate on this higher band as opposed to the 2390-2400 MHz band.

ARGUMENT

I. It Would Be Unlawful for the Commission to Allocate the 2390-2400 MHz Band to a Service Category Encompassing Any Fixed or Mobile Communication

The Commission may not lawfully allocate the 2390-2400 MHz band to a new "Fixed and Mobile Service" for three reasons. Each is discussed below.

A. Allocating the Band to a Service that Permits Any Fixed or Mobile Communication Would Be Inconsistent With Section 303 of the Communications Act

First, allocating the band to this new category of service would violate Section 303 of the Communications Act. 47 U.S.C. § 303 (1988 ed.). By its terms, this provision requires the Commission to "[c]lassify radio stations . . . [into different

⁵/ (...continued)
bandwidth to provide two channels of video programming and nine channels of audio programming.

classes, p]rescribe the nature of the service to be rendered by each class . . . [and a]ssign bands of frequencies to the various classes" The provision is designed specifically to ensure that the service provided by a licensee benefits the public interest rather than the licensee alone.^{6/} An allocation to the new Fixed and Mobile Service would be an abdication of the agency's responsibility to determine service classes rather than a reasonable exercise of discretion under Section 303 since every conceivable communications service is included in this class. While the agency has considerable discretion to define classes,^{7/} it plainly does not have authority to exercise this discretion by allocating to a service classification which includes every conceivable communications service since its statutory duty to develop classes of service then would be irrelevant.^{8/}

Congress has warned the Commission to take Section 303 seriously. For example, in 1985 the Senate Committee on Commerce, Science and Transportation informed the agency that its plan to

^{6/} See, e.g., NBC v. U.S., 319 U.S. 190 (1943); Fed. Radio Commission v. Nelson Bros. Bond and Mortgage Co., 289 U.S. 266 (1933); U.S. v. Am. Bond and Mortgage Co., 31 F. 2d 448 (N.D. Ill. 1929).

^{7/} See FCC v. WNCN Listeners Guild, 450 U.S. 582, 594 (1980) and cases cited therein.

^{8/} It is surprising that the Commission proposes to abdicate its responsibility under Section 303 because in the past the agency has recognized its obligation under this Section. For example, it carefully circumscribed the types of services that Public Land Mobile Radio Service licensees may provide in order to ensure that "different service categories [do not] . . . compete for the same frequencies." Flexible Allocation in the Domestic Public Land Mobile Service, 4 FCC Rcd. 1576, 1580 (1989). See also Creation of an Additional Private Radio Service, 57 Rad. Reg. (P&F) 2d 559, 564 (1984) (recognizing obligation under Section 303 to define discrete service categories in allocation decision).

allocate 24 MHz of spectrum to a new service called "General Purpose Mobile Service" was unlawful:

"The Commission's proposal . . . that applicants for different services, such as the private land mobile service and the cellular radio service, compete for the same spectrum . . . is not authorized by law. The Communications Act requires the Commission to award spectrum by making discrete allocations of spectrum to each service as the public interest requires."^{2/}

As a result, the Commission abandoned its plan and instead allocated specific parts of this spectrum to the Cellular Service,^{10/} the Public Land Mobile Service,^{11/} the Air-Ground Radiotelephone Service,^{12/} and the Narrowband Personal Communications Service.^{13/}

Congress recently reaffirmed its commitment to ensure that the Commission take seriously its responsibility under Section 303. Thus, in authorizing the agency to grant certain licenses by auction, it simultaneously amended the Communications Act to make clear that this auction authority does not replace the Commission's

^{2/} S. Rep. No. 301, 99th Cong. 2d Sess. 34 (May 15, 1986).

^{10/} Report and Order in GEN Dkt. Nos. 84-1231, 84-1233 and 84-1234, 2 FCC Rcd. 1825 (1986), recon. denied, 2 FCC Rcd. 6830 (1987).

^{11/} Id.

^{12/} Amendment of the Commission's Rules Relating to Alloc. of the 849-851/894-896 MHz Band, 5 FCC Rcd. 3861 (1990), recon., 6 FCC Rcd. 4582 (1991).

^{13/} Amendment of the Commission's Rules to Establish New Narrowband Personal Communications Services, 8 FCC Rcd. 7162 (1993).

Section 303 obligation to allocate spectrum to discrete categories of service that meet the public interest:

"Nothing in this subsection [authorizing grant of licenses by auction] . . . shall . . . alter spectrum allocation criteria . . . established by the other provisions of this Act."^{14/}

While the Commission claims that its First Report and Order in ET Dkt. No. 92-9 is precedent for its proposal to authorize any use of the subject spectrum^{15/}, it is mistaken. In that order, the Commission held only that the subject bands would be allocated in the future to discrete services:

"[W]e are allocating . . . [these] bands for the development and implementation of emerging technologies. . . . The use of these . . . [bands] will be developed in ongoing and future proceedings that will address particular emerging technology services."^{16/}

By contrast, the Commission has proposed in its present Notice to allocate the 2390-2400 MHz band to an open-ended service category now rather than reserve the band for future allocation to one or more discrete services.

^{14/} 47 U.S.C. § 309(j)(6), added to the Commun. Act by the Omnibus Budget Reconciliation Act of 1993, supra, at § 6002(a).

^{15/} Notice at ¶ 8.

^{16/} 7 FCC Rcd. 6886, 6890 (1992) (emphasis added). In subsequent orders, the Commission has allocated most of the "emerging technology" bands to discrete services. See Amendment of the Commission's Rules to Establish New Personal Communications Services, 8 FCC Rcd. 7700 (1993), modified, 75 Rad. Reg. 2d (P&F) 491 (1994) (allocating portions of these bands to three discrete services -- one called licensed PCS, one called unlicensed asynchronous PCS, and the third called unlicensed isochronous PCS). The remainder of the band is unallocated and thus unavailable for use in providing any communications service.

B. Allocating the Band to the New Fixed and Mobile Service Category Also Would Be Inconsistent With Section 115(a) of the National Telecommunications and Information Administration Organization Act

Allocating 2390-2400 MHz to a new Fixed and Mobile Service also would be unlawful under Section 115(a) of the National Telecommunications and Information Administration Organization Act. 47 U.S.C.A. § 925(a) (1994 supp.). That provision requires the Commission to allocate this band to a service that is substantially compatible with co-channel amateur operations. Yet the vast majority of fixed and mobile services cannot co-exist with co-channel amateur operations as the Commission itself has acknowledged.^{17/}

Section 115(a) governs the Commission's allocation decision for any band abandoned by the government pursuant to Section 6001 of the Omnibus Budget Reconciliation Act of 1993, supra, note 2. As indicated above, the Secretary of Commerce was required by that Act to identify 50 megahertz of spectrum for reallocation from government use to non-government use based on criteria set forth in the law. One of those criteria, codified at 47 U.S.C. § 923(c)(3)(C), required the Secretary to consider "the extent to which . . . commercial users could share the . . . [band] with [co-channel] amateur radio licensees." Although Section 925(a) does not, by its express terms, require the Commission to make its allocation decision based on this same criterion, it does so by

^{17/} Notice at ¶ 11. Proponents of several of these other services also have admitted that the services they advocate cannot share spectrum with the Amateur Service. See Sec.III.A.1., infra.

necessary implication.^{18/} This is because it would have been irrational for Congress to order the Secretary to identify bands in which commercial usage is largely compatible with co-channel amateur operations while giving the FCC carte blanche authority to allocate those bands to a Service that is substantially incompatible with co-channel amateur operations.

C. It Also Would Be Arbitrary and Capricious for the Commission to Allocate the 2390-2400 MHz Band to This Broad Service Category Given the Agency's Own Findings

Not only would it be unlawful under Sections 303 of the Communications Act and 115(a) of the National Telecommunications and Information Administration Organization Act for the Commission to allow use of the 2390-2400 MHz band for any purpose, it also would be unlawful to do so under Section 706 of the Administrative Procedure Act, 5 U.S.C. § 706. That statute prohibits agencies from basing policy decisions, including spectrum allocation decisions, on findings that are "arbitrary . . . [and] capricious." A decision to allocate the 2390-2400 MHz band would be arbitrary and capricious because it would be flatly inconsistent with the agency's own findings in the three respects described below.

First, allowing use of this band to provide any type of service is inconsistent with the Commission's tentative finding that four discrete services have merit since none of them could be offered technically under the regulatory structure the agency recommends. Specifically, if the Commission allocates the band to

^{18/} The Supreme Court has held that all grants of statutory authority are subject to any implied limitation necessary to carry out Congressional will. See Helvering v. Hammel, 61 S.Ct. 368 (1990), Stafford v. Briggs, 100 S.Ct. 774 (1980).

a new Fixed and Mobile Service, it proposes to assign just two megahertz to each licensee.^{19/} Yet services which the agency lauds -- AAVS, wireless local loop, unlicensed PCS, and MDS -- each require more than 2 MHz.^{20/} An AAVS licensee needs five megahertz of bandwidth to make AAVS economically attractive to airline passengers and airlines. A wireless local loop licensee needs 10 megahertz.^{21/} Unlicensed PCS requires an additional 20 megahertz according to the Commission.^{22/} MDS requires six megahertz according to the Commission.^{23/}

^{19/} Id. at ¶ 9.

^{20/} The Commission also speaks favorably of a fifth service, IVHS. Notice at ¶ 14. But the only party even to mention the possibility of using the 2390-2400 MHz band for this purpose in response to the earlier Notice of Inquiry in this proceeding -- Motorola -- did so very casually. In fact, Motorola stated that the band would be just marginally useful in providing IVHS at best and that further study is necessary in order to determine whether it is even marginally useful. Comments of Motorola, Inc. in ET Dkt. No. 94-32 at 2, 10-11 (Jun. 15, 1994) (responding to FCC's earlier Notice of Inquiry in this proceeding).

^{21/} See Reply to Opps. to Southwestern Bell Corp's. Pet. for Recon. at 2-3 (Dkts. No. 90-314 and 92-100, Jan. 13, 1994):

"The extensive internal analysis that SBC has done . . . indicates that 10 MHz will support an economic development of wireless access to the public switched telephone network. . . ."

^{22/} See Amendment of the Commission's Rules to Establish New Personal Communications Services, supra, 8 FCC Rcd. at 7738 (allocating 40 MHz of spectrum to unlicensed PCS services), modified, 75 Rad. Reg. 2d (P&F) at 512 (reducing allocation for unlicensed PCS services to 20 MHz while promising to allocate additional spectrum shortly).

^{23/} Notice at ¶ 14 n.28. The Commission's proposal to limit each licensee's service territory to a small geographic area also would preclude the offering of AAVS because AAVS is inherently nationwide in scope. Airlines are not interested in offering AAVS along only certain routes. But even if an airline were interested in doing this, its entire fleet still would have to be equipped with AAVS receivers since different airplanes fly different routes each day.

A decision to allow provision of any communications service on the band also would be arbitrary and capricious because it would permit licensees to provide services which the agency tentatively has concluded are not in the public interest. Thus, the Commission has noted that some have proposed that the band be allocated to rural interactive video service, low power communications service, mobile-satellite service, or advanced private communications service.^{24/} But it has tentatively concluded that many of these services are not in the public interest since they "are already adequately accommodated in other bands. . . ." ^{25/}

Opening 2390-2400 MHz for any use also is inconsistent with the Commission's commitment in the Notice to allocate the band in a way "that provides for competition in the provision of new services."^{26/} Rather than ensure competition, an allocation that permits any use is likely to ensure an absence of competition as different licensees use their licenses to provide services which compete only marginally with each other, if at all.

II. Allocating Spectrum to a Service that Allows Any Fixed or Mobile Communication Would be Inconsistent with the Commission's Stated Objective in Proposing an Allocation to This Service Category

The Commission's stated objective in proposing to allocate the band to a new Fixed and Mobile Service, rather than to a discrete service, is to let the marketplace decide what services will be

^{24/} Notice at ¶ 16.

^{25/} Id.

^{26/} Id. at ¶ 9.

offered.^{27/} According to the Commission, the marketplace can decide this matter more efficiently than the government.^{28/}

In fact, it is unlikely that the Commission can achieve its stated objective by allocating spectrum to a new Fixed and Mobile Service as proposed. This is because the agency must adopt technical standards to govern licensee operation in whatever new service it authorizes, and the agency's selection of some important technical standards may force it effectively to decide what types of fixed and mobile services to permit. For example, if the agency required each licensee to operate on a maximum of 2 MHz of spectrum as proposed, this decision effectively would put the Commission (rather than the marketplace) in the position of prohibiting the provision of AAVS, MDS, local loop service, and unlicensed PCS since each requires more than 2 MHz of bandwidth as explained above. Similarly, if the Commission required each licensee to serve a discrete geographic area rather than permitting nationwide service, this decision effectively would put the Commission (rather than the marketplace) in the position of prohibiting provision of AAVS since this service is inherently nationwide in scope as explained above.

Even if it is possible somehow for the FCC to adopt technical standards that preserve the ability of licensees to provide any terrestrial fixed or mobile service, it still would be impossible to adopt technical standards that permit provision of both terrestrial and aeronautical services on the same band. This is because

^{27/} Notice at ¶ 8.

^{28/} Id.

a receiver on board an aircraft flying at 30,000 feet is within the line-of-site of any transmitter located 250 miles from the aircraft. By contrast, a terrestrial receiver typically is within the line-of-site only of transmitters located fewer than 50 miles from the receiver. As a result, adoption of technical standards that successfully allowed licensees to provide any terrestrial service inherently would put the Commission in the position of barring the provision of any aeronautical service, including AAVS, in that band.

Since inherent differences in technical characteristics of terrestrial and aeronautical services make it impossible for the Commission to let the marketplace decide the services that will be offered on the 50 megahertz of spectrum that is the subject of this proceeding, the agency should at the very least establish separate allocations for terrestrial service and aeronautical service. Under this approach, the Commission should allocate the 2390-2400 MHz band to aeronautical service and the other bands to terrestrial service since the 2390-2400 MHz is the only band that can be used economically to provide aeronautical services as explained above.

III. The Commission Should Allocate the 2390-2400 MHz Band to Airline Audio and Video Service Instead of Any of the Other Discrete Services the Agency Mentions Favorably

However, rather than allocate the 2390-2400 MHz band to any broad service category, the Commission instead should allocate the band to a discrete service, and in selecting an appropriate service the public interest requires that it allocate the band to AAVS rather than any other discrete service mentioned favorably by the agency in the Notice.

A. AAVS Will Serve the Public Interest for Five Reasons

Allocating this band to AAVS plainly would serve the public interest for five reasons. Each is discussed below.

1. AAVS, Unlike Any Other Service that Has Been Proposed for this Band, Can Co-Exist With Co-Channel Amateur Operations

First, AAVS, unlike any other service discussed favorably by the Commission, can co-exist with co-channel operations in the Amateur Service.^{29/} As shown in an engineering statement attached as Att. No.1, it appears that AAVS and the Amateur Service can co-exist subject to two simple conditions. In order to protect amateur receivers from interference by AAVS base stations, amateurs would need to locate their receiving antennas beyond the line of sight of a co-channel AAVS transmitting antenna. This would be a relatively insignificant restriction on amateur operations since (1) no amateur receiver will be within the line of sight of more than one AAVS base station, (2) each AAVS base station will operate

^{29/} The Commission has acknowledged that most of the services it views as desirable candidates for this band cannot co-exist with amateur operations. Notice at ¶ 11.

on only one-sixth of the AAVS licensee's assigned bandwidth,^{30/} and (3) individual amateur systems usually require less than 800 kHz of bandwidth and often require less than 50 kHz.^{31/} Second, in order to protect AAVS receivers from harmful interference by co-channel amateur systems, the Commission would need to ensure that amateurs (1) use antennas having gain and bandwidth characteristics similar to those used today and (2) operate their transmitters at power levels no higher than power levels at which they operate today.^{32/}

While it appears that AAVS and amateur operators can share the 2390-2400 MHz band, other services proposed by the Commission cannot. For example, while the Commission stated in the Notice that it might consider allocating the band to a new Wireless Local Loop Service, Southwestern Bell, the primary proponent of that service, admits that an essential prerequisite would be for the Commission

^{30/} If the Commission granted two AAVS licenses (one licensee operating on 2390-2395 MHz and the other on 2395-2400 MHz), amateurs would be precluded from using a maximum of just one-sixth of the 10 MHz bandwidth (i.e., 1.67 MHz) at any particular amateur receiver location as long as the Commission required AAVS licensees to co-locate AAVS base stations. Section 22.1109 of the Rules provides a precedent for requiring base station co-location in an analogous situation. Under that provision, all licensees in the 800 MHz Air-Ground Radiotelephone Service must co-locate base stations. Air-Ground licensees have had no problem complying with this requirement. If an Air-Ground licensee also is licensed to provide AAVS, it could easily co-locate its AAVS base stations with existing Air-Ground stations.

^{31/} See SCRRBA Comments at 5 n.8, 15 (June 14, 1994) (responding to FCC's earlier Notice of Inquiry in this proceeding); Cactus Radio Club Comments at 3 (June 15, 1994) (responding to FCC's earlier Notice of Inquiry in this proceeding).

^{32/} Maximum transmitter power output today typically ranges from 0.1 watts to 10 watts. See Cactus Radio Club Comments, supra, at 3.

to bar amateur operations throughout the band.^{33/} Similarly, although the Commission mentioned in the Notice the possibility of allocating the band to unlicensed PCS, elsewhere it has acknowledged that many unlicensed PCS transmitters cannot share spectrum with any other type of user.^{34/}

2. AAVS Would Satisfy an Unmet Demand for Diverse, Live Programming by the 1.36 Million People Who Fly on Commercial Aircraft Each Day

AAVS also is in the public interest because it would satisfy unmet demand among millions of airline passengers for live audio and video programming. On an average day, 1.36 million people fly in the U.S. on commercial aircraft.^{35/} By 2003, this number will increase to 1.94 million.^{36/} Today's 1.36 million average daily passenger load represents more people than the population of all but the five largest U.S. cities.^{37/} While they are at home, the residents of a typical U.S. city of 1.36 million population can choose from among at least 30 radio broadcast stations, seven television broadcast stations, and 30 non-broadcast cable television channels. By contrast, the 1.36 million people who travel daily by air lack access to similarly diverse programming choices.

^{33/} Comments of Southwestern Bell at 1, 9 (June 15, 1994) (responding to FCC's earlier Notice of Inquiry in this proceeding).

^{34/} Amendment of the Commission's Rules to Establish New Personal Communications Services, *supra*, 8 FCC Rcd. at 7738-39 (concluding that many unlicensed isochronous PCS transmitters require exclusive use of the spectrum allocated to that Service).

^{35/} FAA Aviation Forecasts, Fiscal Years 1992-2003 at 208 Table 10 (FAA-APO 92-1).

^{36/} Id.

^{37/} U.S. Dept. of Commerce, Statistical Abstract of the United States 1993 at 42-44, Table 46.

By making possible 18 channels of live audio programming and four channels of live video programming, AAVS would fill this significant void. In fact, by providing different types of programming on different types of flights, AAVS licensees would be able effectively to offer even more than 18 audio and four video channels. For example, a licensee might choose to provide different channels on prime time business flights than on weekend leisure-oriented flights.

For about two years, Gannett Company provided a two-channel, satellite-delivered live audio programming service to airline passengers, but a service of that type does not meet the customer demand that AAVS will satisfy for several reasons. First, two channels of live audio programming pales by comparison to the 18 channels of audio programming and four channels of video programming that can be provided by AAVS. Second, Gannett's audio sound quality was dramatically inferior to the near-CD sound that AAVS will permit.

More fundamentally, Gannett announced this month that it will discontinue its service this week (on December 23), leaving nearly 1.4 million daily airline passengers with absolutely no live programming. According to news reports, Gannett is discontinuing its service, notwithstanding its belief that a large public demand exists for live programming on airlines, because it concluded that the company could never make its service profitable due in part to the superior AAVS technology. An article from the December 9, 1994 Washington Post discussing these matters is attached as Att. No. 2.

3. The Public Could Benefit Quickly from an AAVS Allocation Because In-Flight Can Provide AAVS Almost Immediately Upon Issuance of a License to Provide the Service

AAVS also is in the public interest because it can be provided almost immediately after a license is awarded due to the fact that In-Flight already has developed much of the necessary technology and is now developing a fully operational AAVS system. In February 1992, the FCC awarded In-Flight a two-year experimental license to develop the audio component of AAVS.^{38/} That license authorized In-Flight to design, construct, and operate a nationwide system of land-based transmitters on 500 kHz of spectrum in the 900 MHz band. After receiving that license, In-Flight awarded a \$5 million contract to Harris Corporation to develop all hardware and software necessary to provide the audio component of AAVS. In-Flight selected Harris because it concluded that the company's specialized knowledge as a major defense contractor would be useful in developing the technology necessary to provide this service. Harris and In-Flight completed work on the audio component of AAVS in mid-1993 when the system was successfully flight-tested.^{39/}

More recently, In-Flight has begun to develop the video programming component of AAVS, and some of this work has been completed. For example, Harris has completed development of the compression technology necessary to permit transmission of four

^{38/} See FCC File No. 2234-EX-PL-91, Call Sign KK2XBN.

^{39/} In-Flight provided the Commission with a photograph of each major component of the completed audio programming system as an enclosure to a letter dated February 25, 1993. See Letter from Rodney L. Joyce to H. Franklin Wright at Exh. 2 (FCC File No. 2234-EX-PL-91, Feb. 25, 1993).

channels of video programming using a channel block that is just 1.33 MHz wide.^{40/} All remaining work to develop the video component of AAVS should be completed within the next few months pursuant to the terms of an experimental license issued a few weeks ago.^{41/} That license authorizes In-Flight to fully develop and market to 100 aircraft a complete AAVS system operating on the 2390-2400 MHz band.^{42/}

4. A Regulatory Structure to Govern
AAVS Can Be Implemented Easily

AAVS also is in the public interest because the Commission can easily adopt a regulatory structure to govern the service. First, it could ensure that the market is competitive by awarding two AAVS licenses, each authorizing operation on half of the 2390-2400 MHz band. Second, it could easily ensure that a large amount of the 2390-2400 MHz band remains available to the Amateur Service everywhere in the country by requiring that each AAVS base station be co-located with Air-Ground Service base stations pursuant to criteria specified in Section 22.1109 of the Rules.^{43/} Third,

^{40/} In-Flight has produced a video tape demonstrating operation of this compression technology in an aircraft environment and will show this video tape to the Commission if it desires.

^{41/} FCC File No. 4448-EX-PL-94, Call Sign KF2XIZ (license effective Oct. 18, 1994).

^{42/} Not only has much of the technology been developed, other important prerequisites to the initiation of service also have occurred. For example, three major U.S. airlines have signed contracts allowing In-Flight to provide AAVS on their commercial fleets if In-Flight obtains a license to provide the service. In addition, ABC Radio Networks has signed a contract to produce and supply all audio AAVS programming for In-Flight. Id. at Exh. 1. See Letter from Rodney L. Joyce to H. Franklin Wright, supra, n. 39, at Exh. 1.

^{43/} See n. 30, supra.

In-Flight believes the Commission could easily develop regulations governing the placement and operating parameters of amateur licensees desiring to use this band in the future. Section III.A.1. of these Comments describes one approach to band-sharing between AAVS and Amateur licensees. In-Flight will cooperate with the Commission as it develops band-sharing rules, and it has informed the amateur community of its desire for a mutually agreeable band-sharing arrangement. Finally, as long as the Commission restricts an AAVS licensee's occupied bandwidth of emissions to its assigned bandwidth, there is no need for the agency to require a specific channelization scheme for AAVS licensees.^{44/}

5. AAVS Would Provide an Important New Source of Revenue for the Financially Strapped U.S. Commercial Airline Industry

AAVS also is in the public interest because it would benefit the American airline industry economically. From the perspective of airlines, live programming is a tremendous improvement over tape-delivered programming because it gives airlines a new source of income at a time when the industry is facing increased financial challenges. On-board tape systems are a cash drain for airlines since airlines must purchase programming and purchase and maintain on-board mechanical tape equipment. By contrast, AAVS would be a profit center for airlines since the AAVS licensee would be responsible for purchasing programming and maintaining all solid state equipment and would give airlines a share of the revenue from

^{44/} The Commission also could limit effective radiated power (ERP) of base stations to 1,250 watts for video signals and 250 watts for audio signals.